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ABSTRACT

In 1986, the National Association of Secondary School Principals (NASSP) published a new learning style instrument, the NASSP Learning Style Profile (LSP). The LSP offers educators a well-validated and easy to use instrument for diagnosing the cognitive styles, perceptual response tendencies, and study and instructional preferences of middle level and senior high school students. This second of two volumes of an LSP handbook presents various ways to adapt the learning environment to learner needs and preferences (the first volume provides activities that are useful in enhancing cognitive skills). The strategies and activities included are keyed to the perceptual, study, and instructional elements of the LSP. Definitions of each learning style element are presented, along with sample items, the research background, and the selected strategies and methods that have helped students with that element of style. The elements discussed are: (1) perceptual response; (2) persistence orientation; (3) verbal risk orientation; (4) manipulative preference; (5) study time preferences; (6) grouping preference; (7) posture preference; (8) mobility preference; (9) sound preference; (10) lighting preference; and (11) temperature preference. In the factor analytic studies of LSP subscales conducted by a national task force, perceptual responses loaded as a relatively independent dimension. Persistence, posture, mobility, sound, and lighting clearly loaded as study preferences. Verbal risk, grouping, manipulative, and (to a lesser extent) temperature loaded as instructional preferences. Study time cross-loaded between study and instructional preferences. An 88-item list of references grouped by learning style elements is provided. An appendix contains the LSP interpretation form. (SLD)

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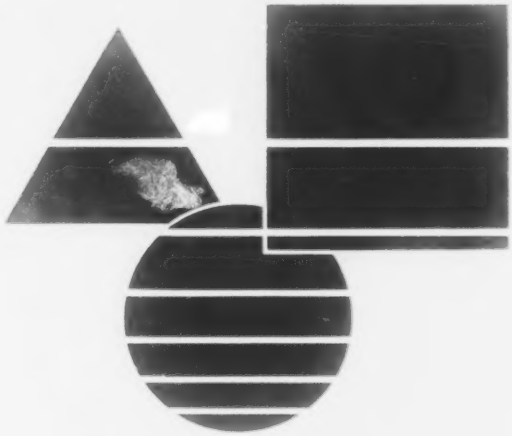
LEARNING STYLE PROFILE

HANDBOOK

II. ACCOMMODATING PERCEPTUAL, STUDY AND INSTRUCTIONAL PREFERENCES



JAMES W. KEEFE

NATIONAL ASSOCIATION OF SECONDARY SCHOOL PRINCIPALS
RESTON, VIRGINIA

LEARNING STYLE PROFILE HANDBOOK: II. ACCOMMODATING PERCEPTUAL, STUDY, AND INSTRUCTIONAL PREFERENCES

James W. Keefe

About the Author: James W. Keefe is NASSP Director of Research and co-author of the NASSP Learning Style Profile.

Executive Director: Scott D. Thomson
Director of Publications: Thomas F. Koerner
Technical Editor: Eugenia Cooper Potter

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National Association of Secondary School Principals
1904 Association Drive • Reston, Virginia 22091
(703) 860-0200

CONTENTS

Foreword v

Introduction vii

Perceptual Response 1

Persistence Orientation 5

Verbal Risk Orientation 7

Manipulative Preference 9

Study Time Preferences 13

Grouping Preference 15

Posture Preference 21

Mobility Preference 23

Sound Preference 25

Lighting Preference 27

Temperature Preference 29

References 31

Appendix: Profile Interpretation Form 37

FOREWORD

The National Association of Secondary School Principals, with the assistance of a distinguished national task force, published a new learning style instrument in 1986—the NASSP Learning Style Profile (LSP). The Profile is second generation technology, building on the research and design of earlier work in the field. Its purpose is to provide educators with a well-validated and easy to use instrument for diagnosing the cognitive styles, perceptual response tendencies, and study/instructional preferences of middle level and senior high school students. The Profile offers school practitioners a way to personalize the instructional process, to identify the dominant stylistic characteristics of students, and to plan instruction accordingly.

The Learning Style Profile opens up new avenues for principals, teachers, and students to create caring and effective schools, places where learners and learning are important, where every student can be reasonably successful in acquiring the knowledge and skills necessary for a productive life. Many of the instructional implications of differing student styles have yet to be investigated, but one thing is certain. Students who understand their learning styles and who exercise active control over their cognitive skills do better in school. They are better adjusted, have more positive attitudes toward learning, and achieve at higher levels than their less skillful peers.

The Profile provides, for the first time, easily usable information on the cognitive elements of style, as well as measures of perceptual, affective, and environmental styles. (See Figure 1 for the relationships among the various LSP subscales based on a human information processing perspective.) Cognitive controls (styles) are internal to the human information processing system and are instrumental in all learning. If a student has good cognitive skills, he or she is ready to learn efficiently and successfully. If a student lacks these skills, frustration and failure are the likely outcomes. Volume I of this handbook provides activities that are useful in enhancing cognitive skills.

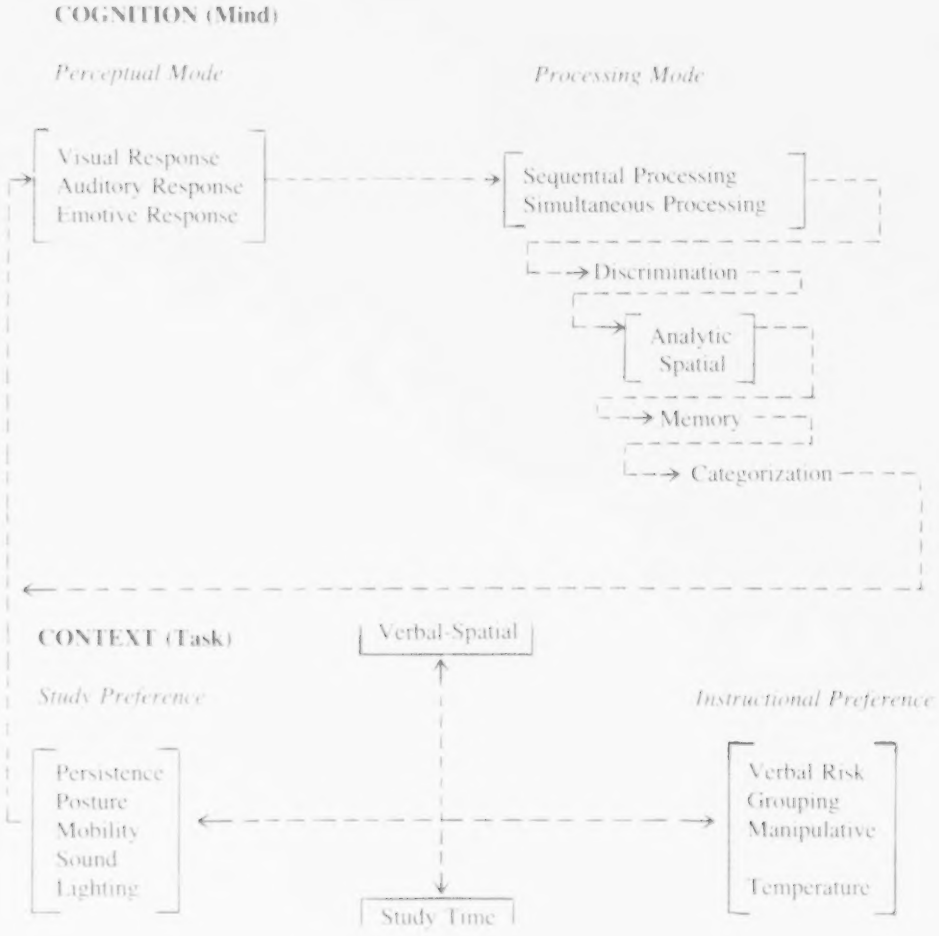
Much of the recent learning style literature has emphasized the perceptual, motivational, or environmental aspects of style. Various ways to adapt the learning environment to these learner needs and preferences are presented in Volume II of the handbook. These strategies and activities are based on the field work of educators with wide experience in innovative schools. They are keyed to the perceptual, study, and instructional elements of the Profile.

The reality, however, is that students with weak cognitive skills will benefit little from an analysis and matching of these other style elements. If students cannot process information effectively, even supportive learning environments will be of little value to them. Fortunately, cognitive skills can be strengthened. The exercises in Volume I of the handbook are designed to support cognitive augmentation or training.

The cognitive elements, then, are the starting point. We are grateful to John Jenkins, Charles Letteri, and Patricia Rosenlund for giving us a practical guide that makes cognitive skills enhancement a real possibility in the school and classroom setting. Thanks also are extended to Marlin Languis of the Ohio State University who reviewed Volume I, and David P. Cavanaugh, LSP Training Coordinator, who reviewed Volume II. Maryellen Parker, NASSP research associate, assisted with the research for Volume II.

James W. Keefe
NASSP Director of Research

Figure 1. NASSP Learning Style Profile Subscale Relationships Based on a Human Information Processing Model (James W. Keefe, 1988)*



*Note: The relationships among perceptual response subscales and cognitive controls are based on typical human information processing patterns. The individual responds to external or internal stimuli (perceptual mode), and the information is automatically processed both sequentially and simultaneously. The individual exercises personal preference in processing mode to discriminate among sequential and simultaneous data. The data are further subjected to analytic and spatial controls, held in short term or working memory and then categorized in long term memory (or rejected). This processing all takes place in the context of verbal-spatial, study, and instructional preferences. The relationships among the later subscales are based on a second order factor analysis conducted by the Learning Styles Task Force. Verbal-Spatial preference is placed between cognition and context because it loaded with the cognitive styles in this analysis but relates to the context. Study time preferences are listed between study and instructional preferences because they cross loaded in the analysis. (See the *LSP Technical Manual* for more detail.)

INTRODUCTION

The Learning Style Profile identifies a number of perceptual, study, and instructional preferences that characterize the sensory, motivational, or environmental responses of the learner. These orientations or biases reflect the learner's preferred response to the school environment. The perceptual response subscales are based on the Edmonds Learning Style Identification Exercise (Reinert, 1976). Many of the environmental style characteristics derive from the work of learning style pioneers Rita and Kenneth Dunn (1978). Two motivational elements are the result of exploratory factor analyses conducted by the NASSP Learning Styles Task Force during the development of the Learning Style Profile.

These perceptual, study, and instructional preferences likely result from predominantly environmental and cultural influences during the early, impressionable years of the learner's growth and development. No empirical evidence exists to show that these elements are genetically imposed to a significant degree, but Thies (1979) does argue convincingly for some genetic component in several of them (e.g., time of day, mobility, environmental factors).

In the factor analytic studies of LSP subscales conducted by the national task force, perceptual responses loaded as a relatively independent dimension. Persistence, posture, mobility, sound, and lighting clearly loaded as study preferences. Verbal risk, grouping, manipulative, and (to a lesser extent) temperature loaded as instructional preferences. Study time cross loaded between study and instructional preferences.

This handbook presents the definitions of each style element, some sample items, the research background, and selected strategies and methods that have been used successfully in helping students with that element of style. Some of the suggested activities have application to more than one style element but are listed under a particular element because of the related research or widespread application in school settings. Not all activities have been rigorously field tested but they have shown at least some relevance in helping students adapt to the demands of different kinds of learning.

Users are encouraged to share with the author other strategies and methods they have found successful. The best of these suggestions for style-based instruction will be included in subsequent editions of the handbook.

PERCEPTUAL RESPONSE

Definition: Initial reaction to information as visual response, auditory response, or emotional and/or physiological response. (From *Learning Style Profile Examiner's Manual*, p. 5.) The perceptual response subscales—visual, auditory, emotive—are based on the Edmonds Learning Style Identification Exercise (ELSIE) developed by Harry Reinert (1976). ELSIE is a measure of perceptual response. The perceptual response subscales measure the tendency of an individual to react to a series of words (representing various concepts and objects) in terms of visual, auditory, or kinesthetic stimuli. The subject may choose any of the three responses for each word, indicating a preference for that response. Most individuals have a dominant preference, but many also have strong secondary response patterns.

Sample Item from the LSP

In the questions on the following page, you will read some words that you know well. As you read each word, notice the *first thing* you think of:

A. Do you see a PICTURE of something?
B. Do you hear the SOUND of the word?
C. Do you have a FEELING about the word?

BEAUTIFUL	A. Picture	B. Sound	C. Feeling
FIVE	A. Picture	B. Sound	C. Feeling
READ	A. Picture	B. Sound	C. Feeling

Research Base

Perceptual response refers to the type and amount of information received by the student. The sources of the information may be external or internal to the learner (the stimulus array of the human information processing system). External sources include sight, sound, touch, smell, and taste. Internal sources are physiological needs like hunger, thirst, fatigue, or emotional upset.

The NASSP Learning Styles Task Force experienced considerable difficulty with traditional modality measures in developing its perceptual response subscales. *A Factor Analytic Comparison of Four Learning Styles Instruments* by task force member Barbara Ferrell (1983) had shown that, of the four instruments evaluated, only the Kolb Learning Style Inventory exhibited a match between factors and scales (but had no modality measures). The Dunn and Dunn Learning Style Inventory (LSI), which did contain auditory, visual, and tactile-kinesthetic modality preference subscales, showed no relationship between the derived factors and the Dunn learning style model. Factor analysis did not contribute any evidence of construct validity for the Dunn LSI and the modality subscales did not load at all. The Dunn instrument contains only affective and physical/physiological elements of learning style, accounting for only 24 percent of the explained variance in the Ferrell study.

LSP Test Development: Early plans by the NASSP task force to develop perceptual *strength* items (assessing discrimination and development) were abandoned because of the strong correlation of strengths with preferences reported in the research literature. Instead, a set of 58 perceptual *preference* items was developed, 16 modeled on the Edmonds Learning Style Identification Exercise (ELSIE) format and 42 of the inventory type. Inventory items included 15 visual, 15 auditory, 6 tactile, and 6 kinesthetic. ELSIE is an *oral* exercise and was initially administered in that mode. Students were read 50 common words at five-second intervals and asked to indicate whether they derived meaning:

1. From a mental image of the object or activity;
2. From a mental image of the word spelled out;
3. From the sound of the word alone, without visualization; or
4. From a fleeting kinesthetic reaction, either emotional or physical.

Factor analysis showed modest support for the ELSIE perceptual preference factors but poor internal consistency. The visual and auditory *inventory* items did not load on any independent factor. The tactile and kinesthetic inventory items loaded on a general kinesthetic or manipulative factor, *uncorrelated* with the ELSIE-type items.

Modest success with the ELSIE conceptualization led to a reappraisal and revision of the original format to adapt it for paper and pencil, rather than oral, administration. The second response category was omitted as inappropriate (mental image of the word spelled out). A paper and pencil format was piloted in a midwestern junior high school. Students were asked to react to the original 50 words in terms of *three* categories. Did they derive meaning from: 1) a picture of something; 2) the sound of the word alone; or 3) a feeling about the word. The new format proved reliable and the 20 words most representative of the three categories were incorporated in subsequent drafts of the instrument.

Modality Research: Recent meta-analytic research of modality assessment and instruction raises some questions about the traditional modality model. Kavale and Forness (1987), for example, have shown that considerable overlap exists between groups exhibiting a modality preference and those not exhibiting one. A little more than half the experimental subjects in the meta-analysis improved their standardized test achievement, but the effect sizes were small.

The analysis does mix elementary and secondary studies and includes a number of weak studies, so the results should be used with caution.

Nevertheless, the authors conclude:

> Only slightly more than half the experimental subjects realized any gain on standardized outcome measures from instructional techniques designed to capitalize upon their modality preferences, and, even when performance improved, the levels were quite modest and only slightly better than those expected by chance.... The best studies showed no positive effects for modality teaching. Although the poorest studies produced the largest effects, their instructional effects were quite modest.
>
> ... Additionally, it appears that all modalities are strongly involved in the learning process, and academic achievement without the inclusion of all modalities is virtually impossible for a child not suffering a sensory deficit (visual or auditory impairment).

LSP Perceptual Response Conceptualization: Why should these conclusions be any different for Learning Style Profile perceptual response subscales? The answer lies in the nature of these subscales and how they differ from traditional modality strength or preference measures. Perceptual *strength* characterizes the functional level of one or more of the information-gathering modes (Barbe, Swassing, and Milone, 1988). Strengths are assessed by performance tasks that identify a person's relative perceptual efficiency or level of sensory development (e.g., Kirby Modality Index, the Swassing-Barbe Modality Index). A perceptual *preference*, on the other hand, characterizes an individual's affective response to one or more of the sensory modes. The individual expresses a personal preference for information from auditory, visual, or haptic (tactile-kinesthetic) channels. This preference, of course, may not reflect the individual's learning needs.

Perceptual *response* in the more generic sense, however, is the individual's immediate and integrative reaction to sensory stimuli. It is a product of stimulus input and internal processes within the human information processing system. It is the individual's tendency to accept (or reject) at initial input the perceptual data from one or more of the senses. It does not imply a stable preference for processing modalities nor for instructional treatments based on modality preferences.

The LSP perceptual response subscales—visual, auditory, emotive—are based on the Edmonds Learning Style Identification Exercise (ELSIE). ELSIE is a measure of perceptual response. The exercise operates on the premise that each individual is "neurologically programmed" early in life to learn most efficiently in certain ways. In this view, perceptual strengths are thought of as the pattern of internalization of an individual's native language. This "programming" is not genetic but highly environmental in character. Each individual learns to react in preferred ways to sensory stimuli.

The perceptual response subscales measure the tendency of an individual to react to a series of words. The subject may choose visual, auditory, or kinesthetic modalities for each word. A higher score on each subscale indicates a greater *initial preference* for that response.

The Visual and Auditory Response subscales simply assess initial preference for that kind of sensory data. The Emotive Response subscale is more complex. Reinert (1976) characterizes this kind of response as a fleeting kinesthetic reaction that is either physical or emotional. The learner reacts initially to information in a physical or emotional way. A physical response may involve an almost compulsive need to take notes or to write out an exercise. An emotional response may be expressed as a positive or negative attitude toward the content of the message or even the messenger. Emotive learners may require affective (haptic or homeostatic) experiences. Currently, a number of psychologists and researchers are examining the relationship between cognition and emotion (e.g., Herbert Ginsburg, 1986, of Teachers College, Columbia University, and E.E. Mueller of Boston University; Ranald Hansen of Texas A & M University). These scholars believe that the "meaningfulness" of learning is intimately connected with the affective and the psychological, with the "personality of cognition." The Emotive Response subscale may very well tap this relationship.

Indeed, all three LSP Perceptual Response subscales may basically measure an individual's relative tolerance for differing sensory input. Some learners may be comfortable with perceptual data from several modes (flexible learners), while others may prefer auditory or visual percepts, and still others may tend to react emotionally or physiologically to any information. The LSP Perceptual Response subscales are much more limited in scope than traditional modality measures. They provide a starting place for instruction, particularly for content that is basic-skill oriented or of high conceptual level.

Strategies and Methods

Visual Response. Generally speaking, visual learners like to receive information from pictures, graphs, schematic diagrams, and visual media of various kinds. A picture presents its entire message all at one time and yet allows the viewer to inspect its parts at his or her own pace. When a learning task involves understanding a large number of relationships (Levie and Dickie, 1973), the visual learner has the advantage because the visual display presents all the information simultaneously and obviates the need to understand and retain a sequence of concepts. Visual stimuli seem to facilitate divergent thinking, hypothesis formation, creative activities, and inquiry approaches to education.

Pictures also seem to be superior to words for any task that requires learning the names of objects. This finding may have implications for foreign language vocabulary learning (Kopstein and Roshal, 1954). Visual learners may have an advantage here.

Visual learners respond best to material that they can view and inspect; i.e., diagrammatic handouts, pictures, films, blackboard use, overhead transparencies, television, exhibits, etc. Visual learners like to form pictures of objects or concepts. In lecturing, teachers should try to use language that helps visual learners form mental images. In giving directions and explanations, use visual words like look, see, imagine, inspect, dramatize, dream, etc. Also, overhead projector transparencies can be helpful in presenting material visually. Care should be taken, however, to keep the transparencies simple and to use the same words in any auditory presentation that accompanies the visuals.

Auditory Response. Auditory learners like to listen to others talk about ideas, concepts, and objects. In auditory learning, concepts are presented sequentially. Auditory learners may favor the sequential processing of information but no direct correlation has been established. Studies comparing auditory versus visual presentation of printed materials (Gulo and Barron, 1965) have usually supported reading (visual) over listening (auditory). These studies may be visually biased by the mode of presentation, but, in fact, listeners receive information more slowly and hear it only once while readers receive information at a faster rate (commonly 2 to 1) and have an opportunity to re-read. Auditory presentation seems to be superior to visual presentation for short-term learning tasks (Murdock, 1968), for material when the rate of presentation is rapid, or when the material is presented last in a learning task (recency effect).

Auditory learners, then, are advantaged in some tasks (short-term learning) and disadvantaged in others (textbook use). They like to hear information presented verbally by lecture, tapes, discussion, etc. In presenting to auditory learners, teachers should use descriptive or explanatory language that emphasizes meaningfulness, and that allows the concept to be rehearsed in short-term memory, and to be differentiated from or associated with concepts in long-term memory.

Emotive Response. Emotive response to information is both more primitive and more complex. It is primitive because no cognition takes place without some emotion. It is complex because it may be either a physical (kinesthetic) reaction or an emotional one.

Some learners require a whole body response. They continuously take notes, diagram, or doodle while information is being presented (visually or auditorily). These learners may benefit very little from the typical classroom lecture or audiovisual presentation. They need to be involved directly in their learning. Often they excel in shop or electronic classes, in business skill courses, in physical education, home economics, or the arts, but do poorly in typical academic classes.

Bloom (1976) studied various patterns of school-related, subject-specific, and self-related attitudes, both in relation to student achievement and for diagnostic purposes. He found that academic self-concept alone was the best measure of student achievement but that attitudes toward school in general and toward specific subjects also were useful predictors of student behavior. Students either like or dislike school and various subjects depending on whether they have experienced success in the past. If a student has had positive experiences with school or a particular subject, he or she will tend to view it positively. Eventually, the focus shifts from school or subject to the self. Bloom believes that if students get A or B grades for a number of years in a variety of subjects, they come to view schooling as positive. If they receive grades of D or F (perhaps even C) over the same period of time, they are left with a negative self-concept.

Emotive learners may be affected in much the same way if their primary reaction to information is not physiological but affective. An emotive learner who has had many unsuccessful experiences in school or in specific subjects may develop a closure response to certain kinds of information. Students in the bottom quartile of a class or a particular subject may simply shut out any useful access to new information, whether presented visually, auditorily, or kinesthetically. Their primary concern is with the presenter or the environment, not the information. If the teacher is not supportive or does not present the information in an interesting way, these learners are simply not interested. The teacher's first responsibility is to support and capture the interest of these learners, not to present information that will be ill-received. In the light of current research examining the relationship between cognition and emotion, teachers must be more sensitive to the perceptual response patterns of unsuccessful emotive learners. The method of choice here is, "encourage first, instruct later." Teachers should also emphasize Thomas A. Edison's maxim that "failure is delayed success." Some students need more trial and error and may experience more failure on the road to success.

The emotive learner's preferred perceptual response, after the psychological barriers have been breached, may be the second preference identified by the Learning Style Profile. When the student's self-concept begins to improve, the teacher can emphasize either visual or auditory approaches, depending on the emotive learner's secondary preference.

PERSISTENCE ORIENTATION

Definition: Willingness to work at a task until completion. (From *Learning Style Profile Examiner's Manual*, p. 5.) The Persistence Orientation subscale assesses student willingness to work at difficult tasks or to work without adult supervision or help. The subscale identifies a student's willingness to sustain behavior, to withstand discomfort, and to face the prospect of failure. The Persistence Orientation subscale provides an indirect measure of the characteristic. Direct measures assess actual behaviors (i.e., the time spent or number of trials attempted). Indirect measures collect the individual's perceptions of the behaviors.

Sample Item from the LSP

For questions 61-108, read each sentence and select your answer from the following choices.

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

If I get an answer wrong, I keep trying until I get the right answer.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

Situational factors seem to influence learner persistence more than personality. The student's task orientation and the attractiveness of the task are important influences. Persistence can be improved with moderate and positive feedback to the student, particularly feedback based on the individual's goals (Singer et al., 1981). Achievement motivation (desire to excel), the need to identify with other successful students, and adult example all affect persistence (Clarke, 1972).

Persistence is influenced by achievement motivation (sometimes referred to as intrinsic motivation). Students with strong achievement motivation strive for an internal standard of excellence. They are interested in excellence for its own sake rather than any immediate extrinsic rewards it may bring. (Indeed, external motivators like behavior modification and various rewards often backfire when the incentives are removed. The learner has learned to work for the reward but not for the pleasure of achievement or for legitimate but delayed rewards.) Achievement motivation is stimulated by any task that is worthwhile in itself. It can be aroused either by the expectation of success or the fear of failure. It is related to 1) risk taking, 2) using concrete and immediate feedback to modify personal goals and behavior, 3) assuming personal responsibility, and 4) sizing up the environment for its limits and possibilities (Alschuler, Tabor, and McIntyre, 1971).

Strategies and Methods

Just as students can be assigned different objectives based on their ability and interest, so the length and type of an assignment can be varied for individuals based on their ability to complete or stay with a task. Self-pacing should be considered and introduced, whenever feasible.

Students who need frequent breaks should not be made to feel guilty about taking them as long as they return to the task and complete it. They may be able to acquire the prescribed knowledge and skills in a flexible time period, in accordance with their total learning style (Dunn and Dunn, 1978).

Alschuler and his associates point out that a person is attentive to a task "if his activities continue in spite of distractions, annoyances, interruptions, and other world obstacles. The boy engrossed in a book, happily concentrating in the midst of mild chaos, is a clear example of strong attention." Attention and motivation drive persistence.

Activity. Persistence can be improved by developing Achievement Images (Aims). Aims are personal goals that are measured against some standard of excellence (Alschuler, Tabor, and McIntyre, 1971). Learners have an Aim when they 1) compete against their own past performance, 2) compete with others, 3) try to accomplish something unique, or 4) develop their skills through long-term commitments to some goal. Not every goal is an Aim. A specific desire to have influence is a Power Image, to establish friendly relationships, an Affiliation Image. Aims are goals that involve competition with standards of excellence.

This activity involves Triad Planning Groups (Alschuler, Tabor, and McIntyre, 1971). The directions are simple. Divide the students into groups of three. Ask them to pick a personally meaningful Aim that they are willing to discuss in the triad. Have them spend 10 minutes writing a succinct (200 words) achievement plan for their Aim. Then, ask them to share the plans with other members of the triad and consider the following questions. (All the questions need not be asked of each member's plan. If possible, however, cover all the questions by the time the three members have finished.)

1. Is the Aim something you want very much? How can you tell how much you want the goal? Is it a moderately challenging risk?
2. Try reading the plan in terms of how much you want the goal, your fear of failure, and hope of success. How realistic is it? How do your feelings strengthen the plan and make accomplishment more likely?

3. Now try reading it in terms of the actions you intend to take, the obstacles you intend to overcome, and the expert help you need. What does it sound like? How do these elements support the chance of success?
4. Are the actions appropriate to the goal? How much room is there for personal responsibility? How much is left to fate, chance, luck, or other people?

Assessing each person's plan should last 10 to 15 minutes for a grand total of 45 minutes to an hour, including 10 to 15 minutes for writing.

VERBAL RISK ORIENTATION

Definition: Willingness to express opinions and speak out even in the face of opposition. (From *Learning Style Profile Examiners Manual*, p. 5.) The Verbal Risk Orientation subscale emerged from exploratory factor analysis of items written to assess the constructs of anxiety, risk taking, and an active/reflective dimension based on Jung's psychological type theory. Factor analysis deleted most of the more than 50 items developed to measure these three constructs. Those remaining loaded, not on the predicted scales, but as a new and independent factor.

The Verbal Risk Orientation subscale measures a student's willingness to verbalize, and to state opinions even if others disagree. It assesses whether the learner is comfortable speaking out and defending thoughts and ideas before a group.

Sample Item from the LSP

For questions 61-108, read each sentence and select your answer from the following choices.

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

I am very comfortable speaking in front of a group.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

Anxiety, risk taking, and extraversion/introversion are among the most widely researched of psychological variables. Anxiety is the level of arousal of an individual under conditions of stress. Anxiety is a complex emotional experience that includes inner tension. It may be a state (situational) or a trait (anxiety proneness). The research seems to indicate that more able students benefit from a reasonable level of anxiety (e.g., Spielberger, 1966).

Risk-taking behavior involves choosing among alternatives whose outcomes are uncertain. Risk taking reflects differences in individual willingness to take chances to achieve some goal.

The extraversion/introversion dimension of Jung's (1923, 1971) personality typology translates easily into an active/reflective style element. Extraverts tend to focus on the outer world, on people and things, and are sociable, outspoken, and action oriented because they do their best thinking aloud. Introverts tend to focus inwardly on ideas and concepts, to be reflective, and to sustain attention toward a deeper understanding before verbalizing their ideas. Kolb (1978) and others have conceptualized this dichotomy as an active vs. reflective continuum.

A number of test instruments have attempted to measure behaviors associated with these constructs. The Talkativeness, Gregariousness, and Impulsiveness scales of the Personality Research Inventory (PRI), for example, all emphasize communication and expression as a preferred activity. These PRI scales, in turn, correlate significantly with Extraversion on the Myers-Briggs Type Indicator (MBTI) and in various combinations with other MBTI scales (Myers and McCaulley, 1985).

In preliminary pilot studies of the LSP, more than 50 items were developed for subscales labeled Anxiety, Risk Taking, and Active/Reflective. When factor analysis failed to show strong factor structure or internal consistency for these subscales, 27 new items were written. Nine of the items loaded on a new factor that was initially labeled Willingness to Verbalize. Six of the strongest-loading items were retained for further investigation and showed a strong factor structure emphasizing a verbal risk and talkative dimension.

The Verbal Risk Orientation subscale draws on elements of anxiety, risk taking, and extraversion to form a new learning style construct.

Strategies and Methods

Students with strong Verbal Risk Orientation tend to speak up in class or in groups. They assume the risk of sharing their ideas in the public forum. For extraverts, this represents a natural way of developing their ideas—by thinking out loud. For introverts, the group experience can be a trying one. They are inclined to take time and to require privacy to think out their thoughts. They are often silent in groups when they have not had an opportunity for reflection.

Teachers must be careful not to construe the readiness of the extravert to speak out or of the introvert to be reflective as signs, respectively, of interest or disinterest, of strong or weak participation, of a knowledge or ignorance of the subject under discussion. Both extraverts and introverts can make useful group contributions. The extraverts must be encouraged to think before speaking; the introverts to risk the possibility of a less than fully reflective statement.

Small groups of various kinds are good vehicles for encouraging verbal risk. The groups should be small enough to give everyone an opportunity to participate and to help the less talkative overcome their reluctance or embarrassment to share what may seem to them to be less than perfect ideas.

Activity. Cooperative learning is a term applied to various instructional methods that allow students of all levels of achievement to work together in small groups toward a common goal. Four elements are essential for small-group learning to be cooperative:

1) *Positive interdependence* among learners, achieved by establishing mutual goals, dividing the labor, materials, and resources; assigning different roles; and giving joint rewards;
2) *Face-to-face interaction*, promoted by small group size (two to six members);
3) *Individual accountability* for mastering the assigned material;
4) *Interpersonal/small-group skills*, permitting all group members to collaborate and to maintain effective working relationships.

The most frequently used cooperative learning methods have been developed at Johns Hopkins University (Robert Slavin, David DeVries, Keith Edwards), University of California at Santa Cruz (Elliot Aronson), the University of Minnesota (David Johnson, Roger Johnson), and the University of Tel Aviv (Shlomo Sharan, Rachel Hertz-Lazarowitz). These methods include:

- *Student Teams-Achievement Divisions*
  Students are heterogeneously grouped in four or five-member learning teams. The teacher introduces new materials by lecture or discussion. Students use worksheets and help one another in pairs. After practice, students take individual quizzes which contribute to team scores.
- *Jigsaw*
  Students are assigned to six-member teams to work on subject matter broken down into five sections (two students share one section). Each student studies his/her section, meets with members of other teams in "expert groups" on the same section, and then teaches his/her own teammates about the section.
- *Jigsaw II*
  A modification of Jigsaw in which four or five-member teams work on the same subject matter, but each student receives a topic on which to become an expert. Students meet in "expert groups," teach their teammates, and then take individual quizzes that contribute to team scores.
- *Learning Together*
  Students work in heterogeneous two to six-member teams on assignment sheets. Teams hand in a single sheet and are graded solely on the group product. Both group collaboration and inter-group competition are used, and evaluation is criterion-referenced.
- *Group-Investigation*
  Two to six-member groups use inquiry methods and group discussion to develop cooperative projects. Teams choose subtopics from a unit being studied by the entire class, break their subtopics into individual tasks, and prepare a group report for presentation to the entire class.

A useful way to evaluate the success of these cooperative small groups is to take videotapes (or Polaroid pictures) of their activities during the first and second quarters of implementation. Student self-concept test scores should also improve over a semester or year period of time.

For more information, see *Cooperative Learning: Student Teams* by Robert E. Slavin (1982) and "Cooperative Small-Group Learning," an *NASSP Practitioner* by David W. Johnson and Roger T. Johnson (1984).

MANIPULATIVE PREFERENCE

Definition: Preference for "hands-on" learning activities. (From *Learning Style Profile Examiner's Manual*, p. 5.) The Manipulative Preference subscale resulted from preliminary testing of items written to measure perceptual response. Forty-two Likert-type items similar to those in the Dunn, Dunn, and Price Learning Style Inventory were piloted in visual, auditory, tactile, and kinesthetic preference domains. Item analyses supported some 30 of these items which were included in the first national pilot study. The visual and auditory items were deleted in factor analyses but several of the tactile and kinesthetic items loaded on a general manipulative factor.

The Manipulative Preference subscale identifies learner preference for "hands-on" learning activities. Manipulative learners like to build, fix, make, or put things together, regardless of what their preferred perceptual response might be. No correlation exists between this subscale and the LSP Visual, Auditory, and Emotive Perceptual Response subscales. Manipulative preference very likely assesses *task* orientation while perceptual response measures initial orientation to sensory *stimuli*.

Sample Item from the LSP

For questions 61-108, read each sentence and select your answer from the following choices:

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

I like to make things with my hands.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

The Manipulative Preference subscale resulted from factor analytic investigation of modality items piloted in early field studies of the Learning Style Profile. The subscale resembles tactile-kinesthetic scales used in other instruments (e.g., *Learning Style Inventory* by Dunn, Dunn, and Price, 1985; *Learning Styles Inventory* by Canfield, 1976, 1980; *Cognitive Mapping*, Strother, 1975). No correlation was found in higher order factor analysis between this subscale and the LSP Perceptual Response subscales, but a strong relationship does exist with the Dunn, Dunn, and Price Tactile and Kinesthetic scales. Further analyses are needed of these relationships.

The learning-by-doing or by direct experience evidenced in this subscale is an attribute of the Jungian preference for Sensing as measured by the Myers-Briggs Type Indicator (McCaulley, 1981). It is important to remember, however, that the MBTI measures Sensing as one pole of a bipolar construct, with Intuition (valuing the abstract and intangible) at the opposite pole. One MBTI study found hands-on experiences were preferred by Sensing-Perceiving types (Eggins, 1979). Hoffman, Waters, and Berry (1981) determined that the tangible aspects of computer-assisted instruction were significantly correlated with preference for both Sensing and Introversion on the MBTI. Whether Sensing alone is correlated with Manipulative Preference remains to be investigated.

Strategies and Methods

The manipulative learner likes "hands-on" experiences—the opportunity to make, do, draw, fix, or manipulate something. Many opportunities exist for these kinds of activities in the vocational-technical subjects and in the arts. The problem lies with the academic or conceptual subjects in which teacher lecture and question-answer methods dominate. Following are some manipulative strategies in academic areas which teachers in these fields can incorporate in regular classroom instruction.

- *Language Arts.* Manipulative learners who also prefer visual response, and/or simultaneous processing may benefit from videotape presentations of the great classics of literature. Many classics, such as *Great Expectations*, *Little Women*, *The Red Badge of Courage*, and countless others, are available in excellent film versions with outstanding casts. Similarly, manipulatives with preferences for auditory response and/or sequential processing may respond well to audio-books, the cassette tape versions of the classics read by professional actors or readers.

  Teachers may also be able to involve manipulative learners in model building and role playing. Building scale models of historic places like Shakespeare's home or objects like the ship Bounty (*Mutiny on the Bounty*) may help manipulatives develop the interest to read some of this classic literature.

  Writing themes and essays can be facilitated for manipulatives by giving them access to word processing equipment or laptop computers, and to cassette recorders (for dictation).
- *Social Studies.* Many of the language arts suggestions also can be used in social studies classes. Videotapes and audiotapes can enliven units on history, geography, anthropology, and psychology. Model building and the use of contour globes that manipulatives can literally handle will stimulate greater involvement. Word processing and tape recording can be used for essays and term papers.
- *Mathematics.* The calculator is an excellent learning de-

use for manipulatives as well as the abacus, the counting device used widely and adeptly in Asiatic countries. Commercially available learning aids like Cuisenaire Rods for measurement (area, volume, etc.) can assist the manipulative learner. Data processing programs available for personal or laptop computers can also be highly motivating and helpful to "hands-on" learners.

- *Science.* Teachers can stylishly simple experiments in most science units to give manipulatives the opportunity to "try it out." Even demonstrations in middle level schools can be good substitutes for direct "hands-on" experiences.
- *Foreign Languages.* Manipulative learners with strong perceptual responses or sequential simultaneous response preferences can be helped by the use of pictures or personal cassette recorders. Kuperman and Roshal (1984) found that pictures are superior to words for remembering the names of objects in a foreign language vocabulary learning. Using laboratory tapes may help the auditory sequential learner.

Activity. Manipulative activities take time to develop and to introduce. Not every learner needs or wants them. These activities are a logical choice for contract learning.

Contract learning is not a new idea. It has been around for a long time, but schools generally have not effectively used this very sensible approach to independent study.

The educational contract is an arrangement between a student and the school in which the student agrees to accept increased responsibility for his learning and the school consents to relax its role of supervision. As students accept responsibility for a significant portion of their learning, they need to spend a corresponding amount of time in constructive independent study. The purpose of the contract is to guarantee student behavior and responsibility.

The contract can be printed as a four-part NCR topic. The original remains with the teacher, the first copy goes to the student, the second copy is sent to the counselor, and the final copy is available for the parents. A sample contract is printed on page 11.

In earlier curriculum projects, student contracts (with a few notable exceptions) have been teacher-made and teacher-assigned and typically assigned to *all* students regardless of learning style differences. In the Chester Park Project, however, the learner according to his or her state of readiness was given the opportunity to work with student contracts in four different approaches.

1. *The teacher-made and teacher-assigned contract.* This has been the standard approach in most individualized instruction projects. Under this arrangement, the teacher makes virtually all the decisions about the content and sequence of the learning activities and the amount of time the student will take to complete the contract.
2. *The teacher-made but student-assigned contract.* From the range of activities that the teacher has prepared, students select one or many of their own choosing and establish their own time lines.

Approaches 1 and 2 are most suitable for slower or somewhat less motivated students.

3. *The student-made and student-assigned contract* as an alternative to the ordinary learning activities of a given unit. The student is encouraged to assess some of his or her own instructional needs. This contract works well with manipulatives.
4. *The student-made and student-assigned contract* developed in a content area identified by the student as one of special personal interest. This is special independent study and is especially appropriate for gifted or highly self-directed students.

Activity: *Electroboards* are teacher-made learning aids that allow tactual learners to literally manipulate the content of a learning task. Manipulative learners often underachieve because the typical classroom does not offer hands-on learning activities that suit their styles. Electroboards are one way to meet the needs of these learners.

Construction requires the following materials (Bruno, 1980):

- Heavy card stock
- Aluminum foil cut into one-half inch wide strips
- Masking tape
- Double sided carpet or mounting tape
- Colored markers
- A paper punch with a large hole
- A continuity tester available from hardware stores (or from the Learning Styles Network at St. John's University, Utopia Parkway, Jamaica, NY 11439)

Construction is outlined in the schematic on page 12.

Manipulative learners can be required to construct their own electroboards for homework as a means of involving them in the content of a unit. Experience has shown that this approach helps underachieving manipulators improve their achievement. For more information on electroboards and other manipulative activities, contact the Learning Styles Network.

SAMPLE LEARNING CONTRACT

DIRECTIONS: Please secure the necessary signatures in the order in which they occur, and return to your teacher.

Date: _____

I, _____ (Subject Teacher) recommend that my student, _____ (name) be placed on contract in _____ (Course Unit).

CONTRACT RECOMMENDATIONS:

Work for Contract	Time or Number of Periods to Complete	Due Date

Signature of Subject Teacher: _____

I, _____ being duly enrolled as a student of this high school, assume responsibility for my own learning. I agree to adhere to the provisions of the above contract until all requirements are met. I recognize that if the contracted requirements are met by the assigned date, I will receive the following grade. If not, I will incur the following sanction(s):

_____

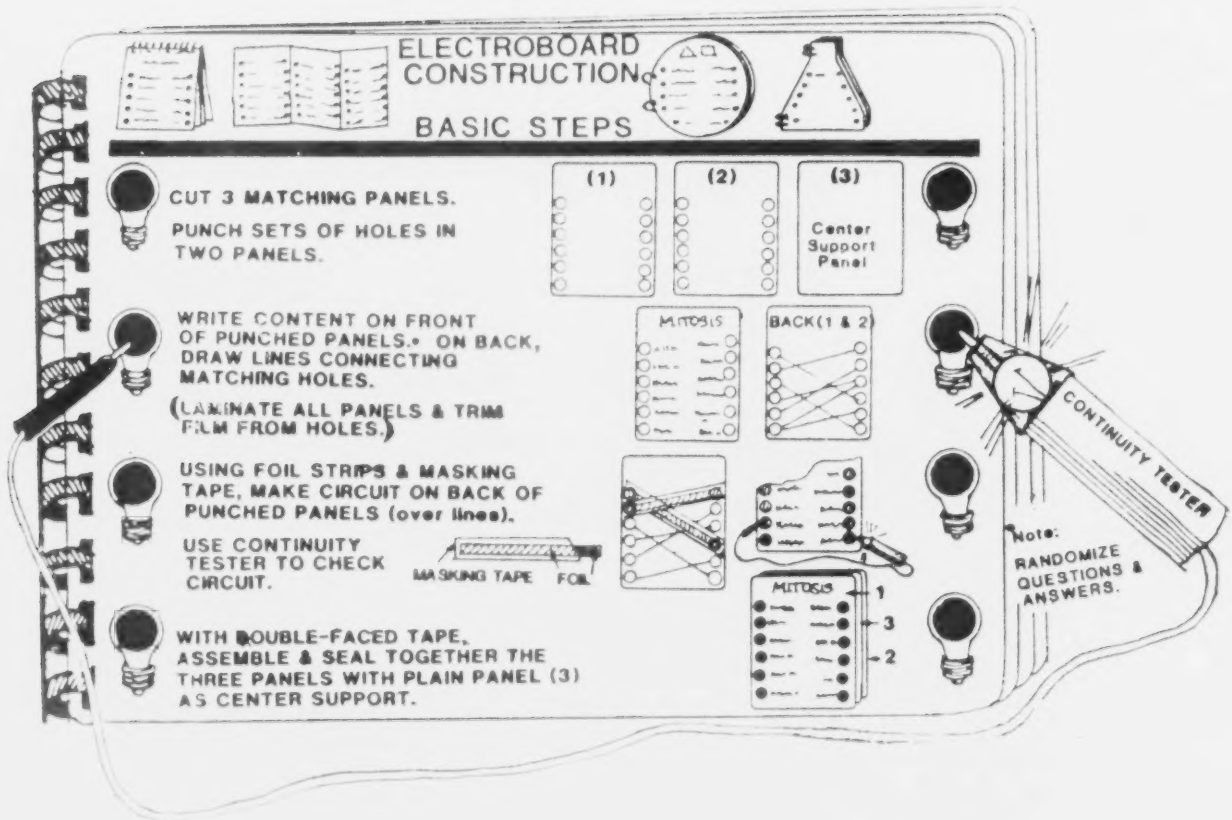
_____

Date: _____ Signature of Student: _____

We have read the above contract and agree with and support its specifications.

Signature of Counselor: _____

Signature of Parent: _____


ELECTROBOARD CONSTRUCTION
BASIC STEPS
CUT 3 MATCHING PANELS.
PUNCH SETS OF HOLES IN TWO PANELS.
(1)
(2)
(3)
Center Support Panel
WRITE CONTENT ON FRONT OF PUNCHED PANELS. ON BACK, DRAW LINES CONNECTING MATCHING HOLES.
(LAMINATE ALL PANELS & TRIM FILM FROM HOLES.)
MITOSIS
BACK (1 & 2)
USING FOIL STRIPS & MASKING TAPE, MAKE CIRCUIT ON BACK OF PUNCHED PANELS (over lines).
USE CONTINUITY TESTER TO CHECK CIRCUIT.
MASKING TAPE
FOIL
CONTINUITY TESTER
Note:
RANDOMIZE QUESTIONS & ANSWERS.
MITOSIS
1
3
2
WITH DOUBLE-FACED TAPE, ASSEMBLE & SEAL TOGETHER THE THREE PANELS WITH PLAIN PANEL (3) AS CENTER SUPPORT.

STUDY TIME PREFERENCES

Definition. Preferences for studying in the early morning, late morning, afternoon, and/or evening. (From *Learning Style Profile Examiner's Manual*, p. 5.) Study Time Preferences are individual variations in learning readiness and attention related to the different times of the day. More technically, these preferences are chronobiological predispositions deriving from the natural rhythms of the human body, i.e., circadian rhythms, early childhood waking and sleeping patterns, temperature variations. Some learners perform best in the morning; others in the afternoon or evening. Individuals are more or less ready to study and learn depending on the time of the day.

Sample Items from the LSP

For questions 61-108, read each sentence and select your answer from the following choices:

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

I am able to understand more of what I learn in the early morning.

A. Always B. Usually C. Sometimes D. Rarely E. Never

I'm better at studying in the late morning.

A. Always B. Usually C. Sometimes D. Rarely E. Never

It's hard for me to think in the afternoon.

A. Always B. Usually C. Sometimes D. Rarely E. Never

I get more work done in the evening than I do all day.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

For almost two decades, chronobiological rhythms have been the subject of formal research. Human bodies (and minds) are under the influence of many predictable biological rhythms—environmental rhythms such as the sleep-wake cycle and the monthly menstrual cycle, variations in body temperature, blood pressure, and stress hormones, etc. These body rhythms are regulated by "zeitgebers" (time givers) such as day length, sunlight, eating habits, and perhaps social contact. The hormone melatonin, for example, is activated by lack of sunlight. This hormone is a natural depressant and stimulates the need to sleep. Exposure to light retards the production of melatonin and contributes to a feeling of energy.

Each person has an accustomed pattern of these rhythms that regulates the individual's readiness for activity. Campbell (1987) characterizes this phenomenon as a freedom-bondage dichotomy, man's reaction to the constraints of clock and calendar. Many people, for example, experience a notable drop in energy and concentration in the afternoon (perhaps an ancient survival preference for napping), but most people do not go to sleep at dusk or awake at dawn as lower animals do. Human beings have some control over these rhythms. Nevertheless, extreme changes exact a price, such as jet lag or the "Monday morning blahs."

Carruthers and Young (1979) specifically studied the relationships among learner study time preferences, discipline, and achievement. This study documented that eighth grade math underachievers with afternoon learning preferences (but scheduled into morning classes) were better motivated and disciplined and improved in achievement when assigned to afternoon math classes. Biggers (1980) also demonstrated, by comparing individual circadian patterns and academic achievement, that the conventional school day incorporates a built-in bias in favor of learners with morning study preferences.

A study by Lynch (1981) about the relationship between study time preferences and school attendance found that time preference was a crucial factor in the reversal of both chronic and initial truancy among secondary students. Two years later, Tappenden (1983) found discernible differences in the chronobiological patterns of Ohio rural, urban, and suburban vocational and non-vocational secondary students. In the same year, Virostko (1983) demonstrated that fourth to sixth grade students whose time preferences and schedules were matched achieved significantly higher scores in mathematics and reading.

The Study Time Preference subscales are the least stable of all the LSP subscales, probably because study time is subject to so many legitimate *uses*. It is likely that general preferences may be stable (i.e., morning vs. evening) but that specific preferences vary with the subject matter, the teacher, etc. These subscales are basic measures for initial diagnostic use. Their minor ambiguities and relative instability, however, suggest that teachers and counselors should review student study time preferences more frequently and observe student behavior for verification.

Strategies and Methods

Middle level and senior high schools with larger enrollments and a wider range of course offerings are capable of scheduling students in their weak subjects at their preferred learning times. Students with *extreme* preferences should be given priority if a learning-style based scheduling process is implemented. A variation on preferred scheduling is to rotate classes throughout the day, allowing them to

be taught, at least on some days, at students' energy peaks, when they feel more productive.

Dunn, Dunn, and Freeley (1984) point out that some districts and schools still teach reading or mathematics in the early morning on the mistaken assumption that all students are most alert then. Ideally, students should be able to schedule their weakest subject at their preferred study time. If math is a student's most difficult challenge, the school schedule should make it possible for him or her to schedule it in the early or late morning or the afternoon, whenever energy level is highest. These scheduling processes assume, of course, that the school is committed to a diagnostic, learning-style-based approach to learning and instruction.

Within individual classrooms, teachers can be aware of student's study time preferences, give low-energy students more support, and suggest that homework be done during the most preferred time (afternoon or evening).

GROUPING PREFERENCE

Definition: Preference for whole class vs. small group vs. dyadic (two person) grouping. (From *Learning Style Profile Examiner's Manual*, p. 5.) The Grouping Preference subscale is the end product of several pilot tests that investigated the construct of social motivation. Learning preference patterns depend, in part, on subject matter, learner attitudes and motivation, teacher characteristics, and classroom environment. Learners are influenced by their socioeconomic backgrounds, cultural environments, value systems, and peer relationships. A psychological need for affiliation may be the root of social motivational preferences.

In the early stages of item development, this subscale, viewed as social motivation, was broadly defined in terms of individual sociocultural differences (family, community, peer groups) and affiliative needs (individual or group, adult or peer, competitive or collaborative, etc.).

Sample Items from the LSP

For questions 61-106, read each sentence and select your answer from the following choices:

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

School is more pleasant when our whole class works together.

A. Always B. Usually C. Sometimes D. Rarely E. Never

I like classes that break up into small teams.

A. Always B. Usually C. Sometimes D. Rarely E. Never

I would enjoy some of my school work more if I had a chance to work with one other student.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

A review of the social motivational factors in learning and instruction reveals several distinct areas of research. Several studies (Johnson et al., 1976; Sharan, 1980; Johnson et al., 1981; Slavin, 1983) investigated the relative merits of cooperative, competitive, and individualized learning approaches. These studies reported a clear advantage for cooperative instructional methods (i.e., peer tutoring, cooperative small groups).

Other studies (Peterson, 1977; Chan, 1978; Ross, 1980) compared the interactive nature of several affiliation styles: high affiliation, low affiliation, achievement via conformance, and achievement via independence. In general, students high on both conformance and independence fared best, demonstrating flexibility in adapting to different groupings. Low conformance/high independence and low conformance/low independence students seemed to benefit most from cooperative learning approaches. Students with high conformance and low independence appeared to do better with more conventional instruction (large groups, teacher lectures).

Several studies (Barrett, 1975; Porter, 1979; Peterson et al., 1983) found that matching students on their dominant motives (achievement, affiliation, power), their affiliative needs and teacher-student influence patterns (teacher-directed vs. teacher-student collaboration), or their instructional preferences (small group, large group, or individualized instruction) did not consistently produce significant achievement results. The Peterson et al. (1983) study disclosed that the effects of matching/mismatching depended largely on initial student attitude toward the subject content and toward self as a learner. The achievement of students with poor initial attitudes was significantly lower in mismatched classes. These findings suggest that matching may be particularly important for students with negative attitudes toward subject or self.

Early LSP pilot studies made it abundantly clear that the preliminary task force definition of social motivation was much too broad for internally consistent scale development and would have to be narrowed. A set of new items was written, narrowing the construct to competitive vs. collaborative relationships and instructional grouping preferences. Six items depicted collaborative relationships (two each for large group, small group, and pairs); two items described competitive settings (one large group, one small group). Two adult-directed arrangements showed marginal factor scores and were dropped.

In concept factor analysis, all collaborative items loaded on the strongest of four pattern factors accounting for 24 percent of the cumulative variance. The competitive items constituted a second factor, adult-oriented items a third, and independent study a fourth. To strengthen subscale internal consistency, only the high-loading collaborative items were retained.

Strategies and Methods

The LSP identifies learner grouping preferences on a continuum from traditional class (25-35) to small group (12-15) to dyadic arrangements (one other person). Students with extreme preferences for dyadic groups may also prefer independent study. The gifted and academically talented frequently fall in the latter category.

Generally speaking, students who prefer traditional classes have what they like. Those who prefer small groups

can benefit from a variety of these experiences. Seven small group types are discussed below. Those who prefer dyadic or independent study arrangements and who have self-directed learning skills can use learning contracts (discussed above under strategies for the manipulative learner). Those who prefer pairs or independent study but who lack the appropriate study or cognitive skills will work better with computer or media-assisted instruction.

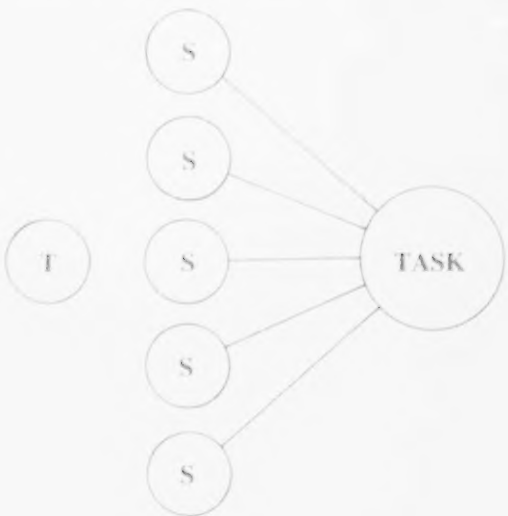
Activity: Small Group Instruction or Discussion. More and more teachers are beginning to use small groups in their work with students. Unfortunately, they generally concern themselves and their groups solely with the *content* (what the group is talking about) and rarely with the *process* of the interaction. By process we mean looking at the ways in which a group handles communication problems, interpersonal relationships, and decision making. "Group dynamics" is not something that occurs or disappears according to the wish of the teacher or the students. Every group has its own dynamics—its unique pattern of forces. These forces exist in varying degrees, and an examination of any group will disclose their presence.

There are many approaches to small group learning. Small group *discussion* emphasizes the learning of *interaction skills*. Small group *instruction* emphasizes *subject matter skills*. Small groups may be teacher-dominated or teacher-guided. The following strategies cut across these broad categories. They are by no means all-inclusive or definitive, only suggestive of the vast possibilities within small group learning.

- THE TASK-ORIENTED SMALL GROUP: The purpose is to bring the various members of the small group together to focus on a specific project or proposal. The members of a task group present to the teacher an oral, written, or audiovisual report of their work within the parameters established for assignment (i.e., time, setting, length of report).

  Process—The teacher:

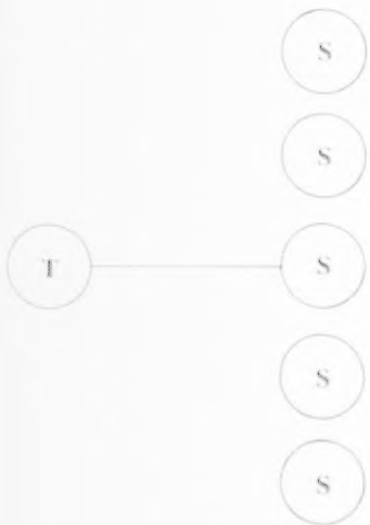
  1. Clearly defines the task so that all members understand and agree.
  2. Sharply delineates roles and assignments for the individual members of the group.
  3. Provides necessary resources or indicates where they may be obtained.
  4. Establishes and requires adherences to a schedule.



- THE DIDACTIC SMALL GROUP: The purpose is to inform, instruct, or clarify abstract material, to review for examinations, or to allow students to interact with questions and comments.

  Process—The teacher or student leader:

  1. Schedules the groups as dictated by teacher or student needs.
  2. Maintains the group size at a maximum of 8 to 10.
  3. Presents the abstract or review material.

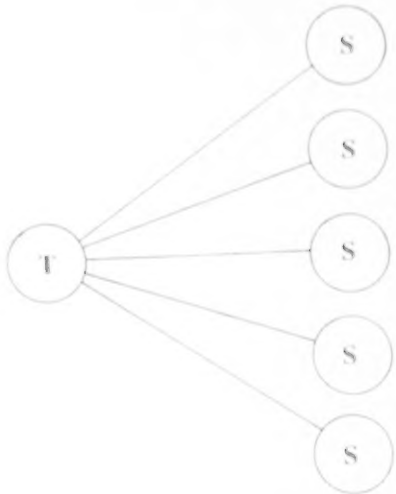


- THE TUTORIAL SMALL GROUP: The purpose is to emphasize instruction usually of a remedial nature, or to evaluate an independent study project of an advanced nature.

  Process—The teacher:

  1. Ensures that remedial work is general enough to benefit all members of the small group.
  2. Deals with each member of the group in turn.
  3. Makes no attempt to stimulate group dynamics and interaction.

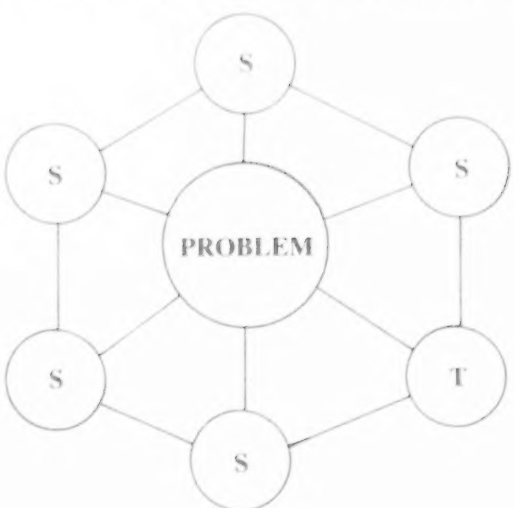
4. Schedules the small group as the need becomes apparent.
5. May assign an aide or a competent student (peer tutor) for remedial work.



- THE SOCRATIC SMALL GROUP: The purpose is to bring students and instructor together to discuss a problem posed by the teacher for which an answer can best be determined through an open and honest exchange of informed opinion. After a problem has been posed by the teacher, the students (a) state their positions and (b) defend them with concrete facts and information. This type of small group always operates at a higher level; there is no place for yes or no or strict recall responses.

Process:

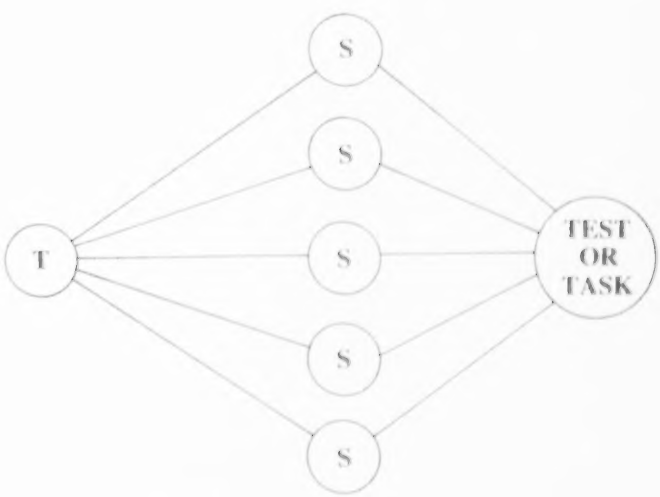
1. The group begins with the teacher challenging, demanding definitions, driving the discussants into a corner to examine their prejudices, to defend their positions.
2. During the second stage, the teacher does a lot of listening and then again becomes a leader and participant—probing, directing, stimulating, responding, and synthesizing.
3. Students must have good listening skills to respond and react to the teacher and their fellow students.
4. This type of group requires at least 40-60 minutes.



- COOPERATIVE SMALL GROUP: Cooperative learning is a term applied to various instructional methods in which students of all levels of achievement work together in small groups toward a common goal. Several elements are essential for small-group learning to be cooperative. The purpose is to promote student achievement through interdependent activity, group interaction, and individual accountability for mastering the material.

Processes:

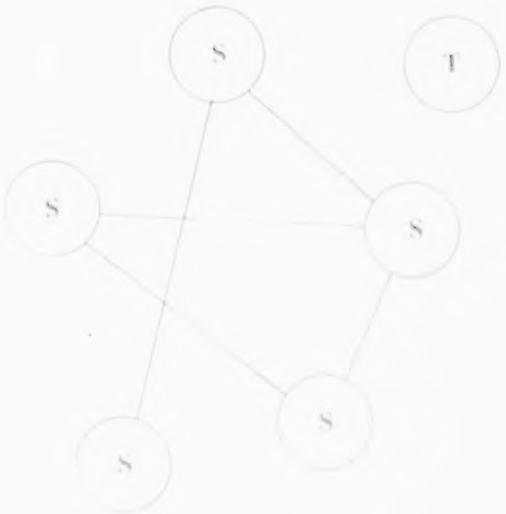
1. *Teams-Games-Tournaments.*
   Uses the same teams, instructional format, and worksheets as Student Teams-Achievement Divisions (cf. Verbal Risk), but students participate in weekly academic tournaments to show their individual mastery of subject matter. Competition is organized among equally achieving individuals from different teams, with scores contributing to team totals.
2. See the discussion under Verbal Risk Orientation for more information and more cooperative small group activities.



- THE BRAINSTORMING SMALL GROUP. The purpose is to bring the various members of the group together to freely discuss a topic which is problem-centered or solution-centered.

  Process:

  1. The ideal number for a Brainstorming group is about 12.
  2. The topic should be relatively simple, familiar, and discussable.
  3. Criticism is ruled out; no negative statements are permitted.
  4. Generating many ideas is desirable.
  5. Combining and improving ideas is highly desirable.
  6. A student recorder prepares a resume for the teacher.



- THE DISCURSIVE SMALL GROUP. The purpose is to encourage free and uninhibited discussion of a topic or topics which have some relevance to the material under consideration or already studied.

  Process:

  1. The structure of the topic(s) is outlined by the teacher prior to the student's coming to the seminar.
  2. The teacher acts primarily as an interested observer who listens attentively, notices who participates, watches for student reaction.
  3. The student's responsibility is to come to the seminar with sufficient background knowledge to participate effectively.
  4. The teacher's primary responsibility is to evaluate the quantity and quality of each student's participation.

Activity Learning Packet, Learning Prescription, Contract Activity Package. The learning package is a basic organizational unit of a curriculum with options. It is not a different kind of textbook or workbook. It is a LESSON PLAN FOR THE LEARNER. It is a structured format for the curriculum which defines for the learner what the options are.

The learning package is a plan that helps students structure their own learning. It is a way to organize materials for independent study or individualized instruction. This individualized lesson plan may not differ greatly from the kind designed for group-paced instruction with which teachers are already familiar. For this reason, it is not difficult for most teachers to write learning packages.

The learning packet or prescription includes the following elements in each unit (Keefe, 1972; Dunn and Dunn, 1978):

1. *Performance objectives* with required performance levels that are simply stated and list exactly what the student is required to learn or do.
2. A *pre-test* to permit the student to "challenge" the unit, concept, or skill (an alternate form of the post-test).
3. The *main idea or component ideas* and sometimes a series of *learning tasks* breaking each complex concept or skill into a sequence of steps.
4. *Multiple resources* (print and non-print) for student choice. These resources should respond to the diagnosed learning styles of different students.
5. *Various learning activities* keyed to the performance objectives and multiple resources by which the knowledge and or skills of the unit can be mastered.
6. Provision for *remedial activities* and *enrichment work* at any stage of a sequence.

7. *Self-tests* to allow students to evaluate self-progress and goal achievement.
8. Appropriate *teacher evaluation* of student achievement, including post-tests, oral assessment, student self-grading, and other viable methods.
9. An *annotated bibliography*, wherever appropriate, to serve as a guide for optional reading.
10. A *critique form* to permit student evaluation of the effectiveness of each unit.

A sample learning package from one of the NASSP Model Schools Project schools will be found on the following page.

SAMPLE LEARNING PACKAGE

ENGLISH DEPARTMENT

TITLE: UNIT #54—SATIRE IN ENGLISH LITERATURE ID #055420

MAIN IDEA:

"Satire is the literary art of diminishing a subject by making it ridiculous and evoking toward it attitudes of amusement, contempt, or scorn." Satire uses laughter as a weapon against such objects as an individual, a class, a nation, an idea, or the world. Generally, English satirists excel in their art and the purpose of this unit is to become acquainted with the satire found in representative English works.

COMPONENT IDEAS:

1. Satire may be classified according to its objects. Three such classifications may be satire of society (government, religion, etc.), satire of human weakness, and satire of the world.
2. The satirist employs various techniques to achieve his or her purpose. Some of the more common ones are exaggeration, distortion, and understatement.
3. Satire varies in degree of indirection (deceitfulness) and it can be presented bluntly or subtly.
4. Satire is a technique used in all forms of literature.

PERFORMANCE OBJECTIVES:

1. The student will be able to classify a given work according to the type of satire as discussed in the first component idea.
2. The student will be able to list specific authors and their works which employ the technique of satire. He or she will also be able to determine whether the attack is subtle or blunt.
3. The student will be able to organize and present a creative or analytical project which illustrates a thorough understanding of the nature, techniques, and sources of satire.
4. The student will be able to list the different literary forms in which satire is presented.

LEARNING ACTIVITIES:

1. Read the Information Sheet on Satire very carefully.
2. Choose from the following samples of satire:

Novels: (Read two)	
The Loved One	Waugh, E.
Animal Farm	Orwell, G.
Gulliver's Travels (Book IV)	Swift, J.
Alice in Wonderland	Carroll, L.
Brave New World	Huxley, A.
(Counts for two)	

Drama: (Read One)	
The Importance of Being Ernest	Wilde, O.
Pygmalion	Shaw, G.
Valpone	Johnson, B.
Under Milkwood	Thomas, D.

Essays: (Read two)	
"Dissection of a Beau's Head" (from *The Spectator*)	Addison and Steele
"On Duelling" (from *The Tatler*)	Addison and Steele
"Erewhon"	Butler, S.
"A Modest Proposal"	Swift, J.
"The Rape of the Lock"	Pope, A.

List your selections on a piece of paper. Have your list checked by the teacher and file a copy with him or her.

3. Obtain copies of the above selections and read or listen to the recordings.
4. Write a well-developed paragraph on each selection read, discussing how the author uses satire and the object or objects that he is attacking, and the degree of harshness of the attack. Hand in this assignment to your teacher.
5. Prepare a 20-minute presentation for a seminar group in which you show a thorough understanding of the nature of satire and the types of material with which satire deals. This could be the presentation of a written paper, a panel discussion, a "laugh-in" type program, an original film, or any other method meeting the approval of your teacher. Schedule seminar time.
6. In preparation for the seminar, each student should obtain a Post-Test Evaluation Sheet, and a Student Course Evaluation Sheet from the English Department Records Office.
   a. Fill out the Student Course Evaluation Sheet before the seminar.
   b. Give the completed Student Course Evaluation Sheet and the Post-Test Evaluation Sheet to your teacher at the beginning of the seminar.
   c. The teacher will fill out the Post-Test Evaluation Sheet for your final unit grade.
7. If you wish to do further research on the subject of satire, we suggest that you read the following books:

Feinberg, Leonard, *Introduction to Satire*. The Iowa State University Press (Iowa, 1967).

Worcester, David, *The Art of Satire*. W.W. Norton & Co., Inc. (New York, 1968).

POSTURE PREFERENCE

Definition. Preference for formal vs. informal study arrangements. (From *Learning Style Profile Examiner's Manual*, p. 5.) The Posture Preference subscale assesses learner choice of a formal or informal study environment and related body postures. A student who prefers a formal setting will work in an upright posture at a desk or table, using a straight chair. A student with informal preferences will choose a more relaxed posture, sitting or sprawling on a carpeted floor, a sofa, or an upholstered chair.

Sample Items from the LSP

For questions 61-108, read each sentence and select your answer from the following choices.

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

I study best while sitting straight up in my chair.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Doing homework is easier if I can lie down.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

Few studies have dealt specifically with the posture-related aspects of the learning environment. A considerable amount of research has been done on the differences between traditional and open-space buildings/classrooms (Traub et al., 1976; Beck, 1979). Much of the research has concentrated on the physical setting rather than on the fit between person and environment. Weinstein (1979) found, for example, that different patterns of classroom design and furniture arrangements had little effect on student achievement or verbal interaction but some effect on attitudes and behavior.

Shea (1983) hypothesized that ninth grade students tested in settings congruent with their preferences for formal or informal study arrangements would achieve better in reading comprehension than peers in unmatched settings. His study, using the *Learning Style Inventory* (Dunn, Dunn, and Price, 1985), revealed that students taught and tested in their preferred environments scored significantly higher than the control group. Hodges (1985) replicated this study in math skills with New York City alternative school seventh graders. Her results were the same.

Strategies and Methods

Providing alternatives for students who prefer informal settings is more challenging in middle level and senior high schools than at the elementary level. Informal settings are available in many elementary buildings but secondary classrooms, generally, are quite formal. Some schools have attempted to provide inexpensive bean bag chairs for students who want to change posture frequently. Others have carpeted classrooms and allowed students who show restlessness or fatigue in traditional desks to sit on the floor.

Teachers must judge what is acceptable in this matter to school authorities and to the community. Surely, some arrangement can be worked out for those students who experience real fatigue and loss of motivation in formal environments. Carpeting or softer chairs in the rear of the classroom might be the solution for these learners.

Students, of course, should be able to do their homework in supportive settings. Those who prefer a formal environment should have their own desks at home or a quiet place at the kitchen or dining room table. The neighborhood public library is another useful alternative. Those who prefer informal study arrangements should have little problem at home.

MOBILITY PREFERENCE

Definition: Student preference for moving about and taking breaks while studying vs. working until finished. (From *Learning Style Profile Examiner's Manual*, p. 5.) The Mobility Preference subscale assesses learner need for movement while studying or ability to work in place until finished. Many researchers identify high need for mobility with hyperactivity. Others see mobility as a normal and instinctive behavior for learners faced with a difficult task or an unchallenging learning environment. The construct may be age and sex-related since younger learners and males seem to prefer greater mobility.

Sample Items from the LSP

For questions 61–108, read each sentence and select your answer from the following choices:

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

I find it easy to work for a long time without getting up and moving about.

A. Always B. Usually C. Sometimes D. Rarely E. Never

When studying, I like to take breaks often.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

Clinicians or researchers have often characterized the need for school-aged youngsters to move about as a negative phenomenon, a case of hyperactivity. This labeling process is also sexually skewed. Fadley and Hosler (1979) reported that most students referred to them for clinical treatment were males. Restak (1979) concluded that more than 95 percent of all hyperactives were male. He also noted that current research on brain functioning and sexual differences supported the view that many males learn by manipulating the environment. But the design of most contemporary classrooms provides little outlet for mobility needs. Similarly, Koester and Farley (1977) found that hyperactivity was more readily identifiable in traditional classrooms than in open settings where a broader spectrum of behavior was acceptable.

Della Valle (1984) examined mobility as a learning style element to assess whether students matched by mobility needs to their learning environments would achieve better. Urban seventh graders were presented with word-pair recognition tasks in both mobile and stable environments and tested under both conditions. The study established that students with either preference performed equally well under matched conditions, but significantly lower when mismatched.

Strategies and Methods

Traditional classrooms are geared to students who prefer to sit quietly and act passively. Many teachers presume that restless students are unmotivated and require more structure. In fact, the opposite may be true. Those who require extensive mobility should be permitted informal seating arrangements and the opportunity to move about as long as they do not interfere with the learning of others (Dunn and Dunn, 1978). Truly unmotivated or hyperactive youngsters will quickly show themselves. Those who simply need some mobility will achieve better. Teachers can provide the latter with shorter assignments at different locations or allow short interruptions such as getting a drink or stretch breaks which will provide focus rather than distract these learners.

Dunn, Dunn, and Freeley (1984) also recommend designing a few learning centers within the classroom. This approach works particularly well in the sciences, business education, home economics, physical education, foreign languages (tape recorders), and social studies (projects). In the NASSP Model Schools Project (Trump, 1977), learning was permitted in three settings: home, community, and school. More mobile learners were often more comfortable in the home and community settings than at school. Community-based learning was particularly effective for these youngsters, offering the opportunity for both mobility and enriched learning environments.

SOUND PREFERENCE

Definition: Preference for quiet study areas vs. background sound (radio, TV). (From *Learning Style Profile Examiner's Manual*, p. 5.) The Sound Preference subscale measures individual reactions to auditory stimulation. Some students need a quiet study space while others prefer some kind of background sound as a screen against other distractions. The key element of "sound as screen" seems to be the *level* of stimulation. Moderate background sound or music is helpful to many learners, but research indicates that almost no one learns well in the presence of loud noise or obtrusive popular music (DeGregoris, 1986).

Sample Items from the LSP

For questions 61-108, read each sentence and select your answer from the following choices.

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

I am bothered by any sound when I am trying to think and study for an exam.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Music has a way of helping me think about my school work.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

Individuals have different reactions to auditory stimulation when they are learning something new or concentrating on something fairly difficult. Responses to sound can be classified in three ways. Students exhibit: (a) a need for quiet; (b) the ability to utilize sound as a screen against other distractions; or (c) no apparent awareness of the existence of background sound.

Investigations studying *group* effects of sound on attention to cognitive tasks in reading have elicited ambivalent findings. Some experimenters found that noise had no appreciable effect on normal males and females exposed to various levels of periodic distraction while engaged in reading tasks (Slater, 1968; Weinstein and Weinstein, 1978). Other researchers reported that reading achievement was affected by varying degrees of sound, particularly for females. These investigators found that high levels of sound (either industrial noise or other background sound, sometimes coupled with intense visual distraction) reduced achievement for both boys and girls, but that lower levels and different types of sound (speech, music) did not produce any dramatic differences in achievement (Carter, 1969; Zimmer and Brachulis-Raymond, 1978).

Most investigators reported no sexual differences in these distraction patterns (Slater, 1968; Weinstein and Weinstein, 1978; Zimmer and Brachulis-Raymond, 1978), but at least one researcher found that males performed better than females under both intermittent and constant distraction (Samtur, 1969). Mullikin and Henk (1985) looked at the effects on participants of a quiet reading environment or one with background rock music or classical music. They concluded that, although soft classical music seemed to enhance reading comprehension for many individuals, it was not appropriate for everyone.

Slater (1968), Pizzo (1981), and DeGregoris (1986) studied the performance of *individuals* on tasks under both quiet and noisy conditions (as opposed to analyses of group means). Pizzo found that students who preferred sound scored significantly higher when moderate, intermittent classroom sounds were provided than when they were not. Learners preferring quiet performed best under quiet conditions. DeGregoris found that youngsters in both preference groups could adapt to moderate and constant background and classroom sounds but that neither group could adapt well to conditions of: a) loud, constant, classroom sounds; b) moderate, constant, contemporary music; or c) loud, constant, contemporary music.

Strategies and Methods

Some students study best in relatively quiet surroundings; others require background music as a screen against distractions. Not every student can tolerate background noise, whether musical or otherwise. The era of the open school in the 1960s and 1970s showed clearly that some students (and teachers) cannot block out distracting sounds. Both visual and sound barriers were erected in open schools almost from the beginning to provide low-sound-tolerant learners a more amenable environment.

Almost the opposite is true of students who cannot tolerate silence. When the learning environment is too quiet, they hear every little sound and are much more distracted than when they have a "musical screen." Many of these learners do all their serious work to a musical or even television background. Often they are unaware of the screen and could not tell an observer what is being played or portrayed. They simply need an auditory barrier against other distractions.

Accommodating sound preferences in an ordinary classroom usually involves a few "quick and dirty" techniques that can be suggested and left to students to implement. Dunn, Dunn, and Freeley (1984) suggest the following for those who prefer quiet:

1. Seating away from traffic and activity patterns;
2. Use of ear plugs or cotton to muffle distracting sounds;
3. Carpeted areas (even scraps) in the classroom to deaden the sound.

The few students who really need background music while studying can use earphones and radio or cassette tapes.

During the NASSP Model Schools Project (Trump, 1977), separate quiet and group study areas were available to students. Students who preferred to work together and tolerated background noise could choose the group areas. Other students worked in (rigorously enforced) quiet areas.

The sound environment for homework is typically no problem. Students establish their own conditions and adjust them as their preferences and needs dictate.

LIGHTING PREFERENCE

Definition: Preference for bright vs. lower lighted study areas. (From *Learning Style Profile Examiner's Manual*, p. 5.) The Lighting Preference subscale assesses learner proclivity for higher or lower levels of illumination while thinking or studying. Bright light causes agitation or nervousness in some learners; dim light, drowsiness in others. Research indicates that reaction to light is highly personal and can affect an individual's physical, emotional, or cognitive functioning.

Sample Items from the LSP

For questions 61-108, read each sentence and select your answer from the following choices.

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

I work better in a room that is softly lighted.

A. Always B. Usually C. Sometimes D. Rarely E. Never

I need to have very bright light when I am studying.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

As early as the 1940s the literature raised concerns for the effect of lighting on student functioning. Wurtman (1968) addressed the impact that artificial light had on human biological rhythms. Knirk (1970) studied the eye's reaction to various levels of illumination and their potentially deleterious effects. Horton (1972) recommended that classrooms be designed to meet individual needs. Bartholomew (1972) and Kleiber et al. (1973) conducted research on the comparative effects of types of lighting—natural versus fluorescent.

The first close examination of the lighting requirements of *individual* students was conducted by Krimsky in 1982 using a fourth grade population. The *Learning Style Inventory* (Dunn, Dunn, and Price, 1979, 1985) was used to identify learner preferences for studying in brightly or dimly lighted areas. The subjects were tested for reading speed and accuracy on the Gates MacGinitie Reading Tests in an extremely bright and an extremely dim instructional setting. Scores for both speed and accuracy were significantly higher when the lighting level matched the student's diagnosed learning style preference. Both preference groups performed significantly less well when tested in mismatched conditions.

In a review of the literature, Dunn et al. (1985) found that lighting levels differentiated between good and poor readers. Oexle and Zenhausern (1981) reported that 85 percent of poor readers tended to prefer dim light. These findings were replicated by Golden (1981).

Strategies and Methods

Lighting preferences call for minor adjustments in the learning environment. Indeed, only a few alternatives are possible. Seating arrangements are the primary means of accommodating learner variations. Students who prefer very bright light can be seated in the brightest part of the room and/or near the windows. Those without strong lighting preferences can be seated in any convenient location. Those who need dimmer light can be located in one section away from the windows. If the room has multiple-switched lighting, only half the fluorescent tubes or bulbs could be illuminated. In older buildings, some of the tubes or bulbs could be removed or loosened to lower the level of illumination.

TEMPERATURE PREFERENCE

Definition: Preference for studying in a cool vs. a warm environment. (From *Learning Style Profile Examiner's Manual*, p. 5.) The Temperature Preference subscale assesses learner preference for a cool or warm study setting. General research in the physiological field of thermoregulation suggests that human beings can tolerate environments many degrees below body temperature but only relatively few above. All animals function most effectively at certain temperatures. Below that optimal range, metabolism slows down; above it, the metabolic rate rises rapidly and energy is wasted (Whitlow, 1970).

Sample Items from the LSP

For questions 61-108, read each sentence and select your answer from the following choices.

A. ALWAYS—This sentence *ALWAYS* describes me.
B. USUALLY—This sentence *USUALLY* describes me.
C. SOMETIMES—This sentence *SOMETIMES* describes me.
D. RARELY—This sentence *RARELY* describes me.
E. NEVER—This sentence *NEVER* describes me.

When I really have to think I like to be in a cold room.

A. Always B. Usually C. Sometimes D. Rarely E. Never

I can learn best if I study in a place that is warm.

A. Always B. Usually C. Sometimes D. Rarely E. Never

Research Base

All mammals have distinct heat and cold receptors in the skin, the veins, the spinal cord, and the brain (Harre and Lamb, 1984). Some researchers (Bartley, 1980) argue that temperature and pressure receptors within the body constitute a sixth perceptual system, the homeostatic system. Mammalian body temperature is usually higher than the temperature of the surrounding environment. The brain monitors this difference and activates warming and cooling mechanisms (e.g., sweating and shivering.) Human temperature preferences can extend beyond these innate thermoregulatory mechanisms to the point that noticeable temperature changes can dramatically affect a student's motivation to study and learn.

Mayo (1985) studied training conditions for adult males under two extreme temperature conditions. No significant achievement differences were found between the two groups, but a few subjects in each group said they were uncomfortable. Murrain (1983) investigated the relationships between seventh grade students' temperature preferences and their achievement in cool and warm environments. All subjects were tested on word recognition tasks in warm (80°F) and cool (60°F) classrooms. Students performed better in settings congruent with their temperature preferences.

Strategies and Methods

Teachers have even less control over classroom temperature than other environmental elements of style. In modern schools, classrooms tend to be evenly heated or cooled, with far fewer hot or cold spots than in older buildings that had poor insulation and hot water radiators.

If a classroom has temperature variations, students can be assigned seating based on their preferences. Students who prefer warmth can be seated near the windows for sunlight, but not if the area is drafty. They should be encouraged to bring sweaters for added warmth. Those who prefer cool temperatures should be encouraged to sit away from the sunlight and to wear light clothes. They could sit near the windows (but out of the sun) if there is a breeze.

The environmental elements of style, in general, permit fewer accommodations than the perceptual and other study/instructional elements. Fortunately, however, environmental preferences can be accommodated for most students simply by allowing them to choose their desired locations in the classroom.

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APPENDIX

NASSP Learning Style Profile Interpretation Form

NAME _____ DATE _____ GRADE _____

NASSP LEARNING STYLE PROFILE INTERPRETATION

COGNITIVE SKILLS — General approach to processing information

	WEAK	AVERAGE	STRONG
ANALYTIC — The ability to identify simple figures hidden in a complex field; to analyze information; to use the critical element of a problem in a different way. Most school-related achievement requires this skill. Related to algebra and natural science courses. (Items 25-29)			
SPATIAL — The ability to identify a geometric shape, remember it, and discriminate it from other similar patterns. Also, the ability to rotate objects in the imagination. Related to geometry, drafting, physics, art, engineering, and architecture. (Items 36-40)			
DISCRIMINATION — The ability to visualize the important elements of a task; to focus attention on required detail and avoid distractions; to do what is asked. (Items 7-11)			
CATEGORIZATION — The ability to take some risk in classifying information, using reasonable (vs. vague) criteria to form accurate, complete, and organized categories. Narrow categorizers use more complete, accurate categories to classify information. Broad categorizers lack accuracy and organization in these tasks. (Items 17-24)			
SEQUENTIAL PROCESSING — The ability to process information sequentially taking items one step at a time. The ability to perceive the separate elements of experience; to respond to information verbally. Related to linear tasks (2 + 2) and verbal skills (reading or language arts). Example: Being able to put a bike together *after* reading the manufacturer's directions. (Items 1-6)			
SIMULTANEOUS PROCESSING — The ability to respond to new information visually and spatially; to grasp the entire meaning of an experience at once; to perceive the separate elements of a whole and see the bigger picture when only parts are available. Example: Being able to put a bike together *without* reading the manufacturer's directions first. (Items 12-16)			

MEMORY — The ability to remember discrete bits of information, to detect and remember subtle changes in information. Highly related to school learning: recalling formulas, vocabulary drills, spelling, and many of the basic skills of language and math. (Items 109, 110, 112, 114, 116, 118, 119, 120, 121, 123, 124, 126)

PERCEPTUAL RESPONSES — Initial response to information

	WEAK	AVERAGE	STRONG
VISUAL — Preference for processing information initially by seeing it. Those who are strong visual learners prefer visual, pictorial, or graphic representations. They often close their eyes to reconstruct a picture of what they are trying to remember. (Items 41-60 / A)			
AUDITORY — Preference for processing information initially by hearing it. Those who are strong auditory learners like to listen to others talk about experience. They often repeat to themselves whatever they are trying to learn. Extraneous sound and noises are distracting to them because they tend to respond to all sounds. (Items 41-60 / B)			
EMOTIVE — Preference for processing information initially by reacting with feeling. The response of strong emotive learners is emotional and/or physiological; i.e., becoming angry, calm, happy, tense, etc. (Items 41-60 / C)			

STUDY AND INSTRUCTIONAL PREFERENCES — Personal preferences for the motivational or environmental elements of style

	LOW	AVERAGE	HIGH
PERSISTENCE ORIENTATION — Willingness to work at a task beyond the required time, to withstand discomfort, and to face the prospect of failure. The high persistent learner works at a task until completed, seeking whatever help is needed to persevere. The low persistent learner ususally has a short attention span and gives up easily on demanding tasks. (Items 64, 74, 84, 91)			
VERBAL RISK ORIENTATION — Willingness to verbalize, to state opinions even if others disagree. Verbal risk-oriented learners are comfortable speaking out and defending their thoughts and ideas. They do well in small groups and make good debaters. (Items 75, 92, 95, 107)			
MANIPULATIVE PREFERENCE — Preference for learning or instruction through hands-on activities. Manipulative learners like to build, fix, make, or put things together. (Items 64, 73, 82, 102)			
TIME PREFERENCE — Preference for studying and learning:			
in the early morning. (Items 72, 106)			
in the late morning. (Items 89, 93)			
in the afternoon. (Items 94, 100, 104)			
in the evening. (Items 62, 66, 77)			

VERBAL SPATIAL PREFERENCE — Preference for learning or instruction through verbal or spatial activities. (Items 30-35)

GROUPING PREFERENCE — Preference for learning or instruction in whole class, small group, or with one other student. (Items 65, 70, 83, 90, 99)

POSTURE PREFERENCE — Preference for formal vs. informal study arrangements. (Items 79, 87, 97, 105)

MOBILITY PREFERENCE — Preference for moving about and taking breaks while studying vs. studying in one place until the task is finished. (Items 76, 86, 103, 108)

SOUND PREFERENCE — Preference for a quiet study area vs. one with background sound (radio, T.V.). (Items 71, 78, 81, 101)

LIGHTING PREFERENCE — Preference for a bright vs. lower lighted study area. (Items 61, 67, 69, 80, 98)

TEMPERATURE PREFERENCE — Preference for studying in a warm vs. a cool environment. (Items 63, 85, 88, 96)

HIGH	NEUTRAL	HIGH
SPATIAL		VERBAL
SMALL		LARGE
INFORMAL		FORMAL
STILLNESS		MOVEMENT
QUIET		SOUND
DIM		BRIGHT
COOL		WARM

nassp
1904 Association Drive
Reston, Virginia 22091-1598